Blood-Pressure Control

This interactive feature addresses the approach to a clinical case. A case vignette is followed by specific options, neither of which can be considered correct or incorrect. In short essays, experts in the field then argue for each of the options. Readers can participate in forming community opinion by choosing one of the options and, if they like, providing their reasons.

CASE VIGNETTE

A Woman with Hypertension
James S. Yeh, M.D., M.P.H.

Ms. Weymouth is a 75-year-old woman who presents to your geriatric clinic for routine follow-up. She mentions that she heard a report about blood-pressure control on the news recently that included something about “lower might be better.” She wonders to what level her blood pressure is controlled and whether her blood-pressure medications need to be adjusted today.

Her medical history is significant for hypertension, atrial fibrillation, peripheral arterial disease with mild intermittent claudication, and cataract. Her current treatments include 100 mg of metoprolol succinate daily, 5 mg of apixaban twice a day, 25 mg of chlorthalidone daily, 81 mg of aspirin daily, and 10 mg of atorvastatin daily. She does not have any known drug allergies. She had a left-wrist fracture 6 years ago when she slipped and fell on an icy sidewalk.

She lives at home with her husband, to whom she has been married for 55 years. They have 4 children and 14 grandchildren, all of whom live nearby. She has never smoked, and she drinks 1 to 2 glasses of red wine a week. She and her husband walk regularly for exercise, as you have recommended to reduce the incidence of claudication. She had worked in a bakery before her retirement 10 years ago. She enjoys gardening and other yard work and spending time with friends. A review of her systems is unremarkable.

On physical examination, she looks well. Her weight is 156 lb (71 kg), and her height is 5 ft 4 in. (163 cm); her body-mass index (the weight in kilograms divided by the square of the height in meters) is 26.8. Her heart rate is irregular at 70 to 72 beats per minute, and her blood pressure is 136/72 mm Hg. Her heart sounds are irregular and consistent with atrial fibrillation. There is no murmur. The rest of her physical examination is unremarkable.

Her most recent laboratory results revealed a total cholesterol level of 174 mg per deciliter (4.5 mmol per liter), a low-density lipoprotein cholesterol level of 87 mg per deciliter (2.2 mmol per liter), a high-density lipoprotein cholesterol level of 65 mg per deciliter (1.7 mmol per liter), a serum creatinine level of 0.9 mg per deciliter (80 µmol per liter), and an estimated glomerular filtration rate of 65 ml per minute per 1.73 m² of body-surface area. An ankle–brachial index measured last year was 0.85 on the left and 0.95 on the right.

After obtaining the history and performing the physical examination, what recommendation do you make to Ms. Weymouth about the management of her blood pressure?

Treatment Options

1. Maintain the current antihypertensive regimen.
2. Modify the antihypertensive regimen to reduce the systolic blood pressure further.

To aid in your decision making, each of these approaches is defended in a short essay by an expert in the field. Given your knowledge of the patient and the points made by the experts, which option would you choose? Make your choice, vote, and offer your comments at NEJM.org.

TREATMENT OPTION 1

Maintain the Current Antihypertensive Regimen
George L. Bakris, M.D.

Ms. Weymouth’s hypertension is adequately controlled. Given her history of falls, coupled with her exposure to anticoagulants, the potential harm of intensifying her antihypertensive regimen outweighs the benefit. Her calculated 10-year Framingham risk score is 7%. Apart from hypertension and peripheral arterial disease, the two other major factors associated with cardiovascu-
lar risk (i.e., lipid levels and blood pressure) are within the range associated with lower risk for people younger than 70 years of age. She is already receiving the most effective therapy to reduce cardiovascular risks.

Five randomized and six observational studies have evaluated the effects of blood-pressure control on cardiovascular outcomes in persons older than 65 years of age, with the mean age of participants in these trials ranging from 66 to 70 years. In the majority of these trials, the mean systolic blood pressure achieved was in the mid-140s. Hence, the 2013 Expert Panel Report recommended a blood-pressure goal of less than 150/90 mm Hg for persons over 60 years of age. However, according to data from National Health and Nutrition Examination Surveys (NHANES), the trends in blood-pressure control over the past 50 years, even with a blood-pressure target of 140/90 mm Hg, have been toward lower, not higher, blood pressures and lower cardiovascular event rates. Thus, in all other international guidelines regarding a blood-pressure goal in older people, the recommendation continues to be a goal of less than 140/90 mm Hg.

The data from these trials have limitations, since there are few prospective outcome data from persons older than 75 years of age, with the exception of data from the Hypertension in the Very Elderly Trial. In that trial, in which the mean age of the patients was 84 years, patients in the active-treatment group, as compared with the placebo group, had a 64% reduction in the rate of heart failure and a 21% reduction in the rate of death from any cause. However, the achieved blood pressure was 144/78 mm Hg in the active-treatment group, as compared with 159/84 mm Hg in the placebo group.

The question remains whether the Systolic Blood Pressure Intervention Trial (SPRINT) provides new insights into how low this patient’s blood pressure should be to further reduce her absolute risk of a cardiovascular event. In SPRINT, nearly 30% of the more than 9300 participants were 75 years of age or older. Participants who were assigned to a systolic blood-pressure goal of less than 120 mm Hg and were able to adhere to the medication regimen without unacceptable side effects had better outcomes than did those assigned to a goal of less than 140 mm Hg, which suggests the need for blood-pressure control tighter than that suggested by the results of previous trials. Although the results clearly showed a benefit with respect to all-cause mortality, the findings driving the cardiovascular benefit were a major reduction in the risk of heart failure and of sudden death rather than of coronary disease. A reduction in the risk of heart failure was also seen in all previous trials involving older people that assessed this outcome but at systolic pressures higher than those in the SPRINT trial.

This patient’s systolic blood pressure is higher than the 120 mm Hg systolic goal achieved in SPRINT, but given her history and coexisting conditions, attempts to reduce the current value to achieve a possible benefit would result in more complications if the more intensive regimen led to unacceptable side effects — all for a small reduction in absolute risk. In the SPRINT trial, the risks of serious adverse events of hypotension and syncope were 67% and 33% higher, respectively, with the lower blood-pressure target than with the higher target. Consequently, I would not be in favor of reducing her blood pressure further. I would recommend reassuring her and initiating a discussion with her about the benefit versus the harm of further blood-pressure reduction.

The patient should be congratulated for her adoption of healthy lifestyle habits and her adherence to her medication. She appears to be taking her current regimen without problems. For patients with hypertension, the greatest incentive to pursue treatment is to prevent a negative outcome such as stroke, heart failure, or progressive kidney disease.

The most beneficial blood-pressure target has been debated in recent years. The concept of “lower is better” was widely adopted, especially
for patients at greater risk for clinical events, including those with diabetes or chronic kidney disease, even though this rationale was based on extrapolation from epidemiologic data. The recent trend toward evidence-based guidelines brought widespread public dispute, primarily related to the dearth of clinical trials evaluating lower blood-pressure goals.2

In the Action to Control Cardiovascular Risk in Diabetes (ACCORD) study, a strategy of targeting systolic blood pressure to less than 120 mm Hg in persons with diabetes did not result in a reduction in the rate of major cardiovascular events, although there was a trend toward a better outcome.3 With the publication of SPRINT, there is now strong evidence to support lower blood-pressure targets for persons 50 years of age or older who do not have diabetes but who have other risk factors for cardiovascular events.4

Because SPRINT adopted the study design used in the ACCORD trial, which has already been proved to be safe and effective in achieving blood-pressure targets, the results of SPRINT can be compared directly with the ACCORD results. SPRINT showed a 25% lower rate of cardiovascular-related events and a 27% lower rate of death from any cause in the group with a blood-pressure target of 120 mm Hg than in the group with a target of 140 mm Hg, and the benefit did not differ between persons younger than 75 years of age and those older than 75 years of age. Over the course of 3 years, the event rates were 2.19% per year in the standard-therapy group, as compared with 1.65% per year in the intensive-therapy group, with a separation in risk for overall events evident at 1 year and for overall mortality at 2 years, and the curves suggest greater benefit with additional time. SPRINT is a high-quality, large trial that was well planned and executed; therefore, the findings cannot be dismissed lightly. Even with about 50% of the intensive-therapy group in SPRINT not reaching the systolic blood-pressure target of less than 120 mm Hg, the rates of fatal and nonfatal cardiovascular events and death from any cause were significantly lower among participants in the intensive-therapy group than among those in the standard-therapy group.

Although there were larger numbers of serious adverse events such as hypotension, syncope, and kidney and electrolyte abnormalities in the group with the lower blood-pressure target, the overall rates did not differ significantly from those in the standard-treatment group. The risks of treating to a lower blood-pressure target were small relative to the potential gains in better cardiovascular outcomes. Many patients will accept small inconveniences, such as having to get up slowly to avoid symptomatic hypotension or taking an additional pill, to preserve their health.

The SPRINT results are consistent with epidemiologic and retrospective analyses. The message is clear; we now have data to support more aggressive hypertension goals, and this lower target should be the standard of care. And for many patients like Ms. Weymouth, it is time to tighten blood-pressure control.

Disclosure forms provided by the author are available with the full text of this article at NEJM.org.

From the Division of Nephrology and Hypertension, Mayo Clinic, Rochester, MN.

This article was published on November 9, 2015, at NEJM.org.


DOI: 10.1056/NEJMclde1513565
Copyright © 2015 Massachusetts Medical Society.